

Industry Assessment of Technologies for Managing Poultry Litter



Tyson Foods, Inc.

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Poultry Litter



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- Poultry litter has inherent value
 - Low cost source of nitrogen for forage crops
 - Broad spectrum of micro & macro-nutrients
 - Rich in organic matter for reclaiming and improving problem soils
 - Has value as bulk compost for residential and road construction projects
 - Stabilized and pelletized into organic horticultural blends

Watershed Restoration



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- Primary focus for watershed restoration is the management of phosphorus from multi-media sources
- Organize and remove phosphorus from land application in the affected watershed

Elements of the Solution



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- Transportation costs must be minimized
- Concentrate nutrients by removing phosphorus and other nutrients from litter
- Medium to long term beneficial use for value added nutrients
- Medium to long term return received from balance of litter

Gasification of Litter & Other Nutrient Rich Biomass Materials



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- Gasification – chemical change of biomass using heat
- Gasification produces synthesis gas (syngas) and ash
- Ash quantity requiring transportation reduced by a factor of 5+
- Nutrients are concentrated allowing for multiple use options
- Ash is stabilized for odor and bacterial/viral control
- Syngas has value for multiple uses

Syngas Use



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- Syngas consists of CO, CO₂, H₂, C_xH_y, H₂O, Tars
 - Produce steam/thermal energy
 - Produce electricity
 - Produce thermal and electrical energy (co-generation)
 - Produce alternative products from syngas
 - Anhydrous ammonia
 - Methanol or other refined fuels

Issues with Gasification Process Facility



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- Located in the region to reduce transportation of raw materials
- Availability and affordability of continuous/consistent supply of fuel
- NIMBY
- Bio-security is a must
- Identifying energy “host site(s)”
- Capital costs
- Return on investment must be realized

Reducing the Barriers - Federal Level



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- Clear goals defined through comprehensive energy policy
- Public policy directed towards achieving goals

Reducing the Barriers – State/Regional Level



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- Clear - comprehensive watershed management plan
- Education – ownership by responsible parties
- Education of general population
- Public policy directed towards achieving goals

Closing Comments



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- Litter has value from nutrient components and its energy production potential
- Stranded energy has limited value
- Biomass, especially poultry litter, has a potentially significant role in the upcoming hydrogen economy